THE FACTS

Information About Environmental Cleanup at McClellan AFB.

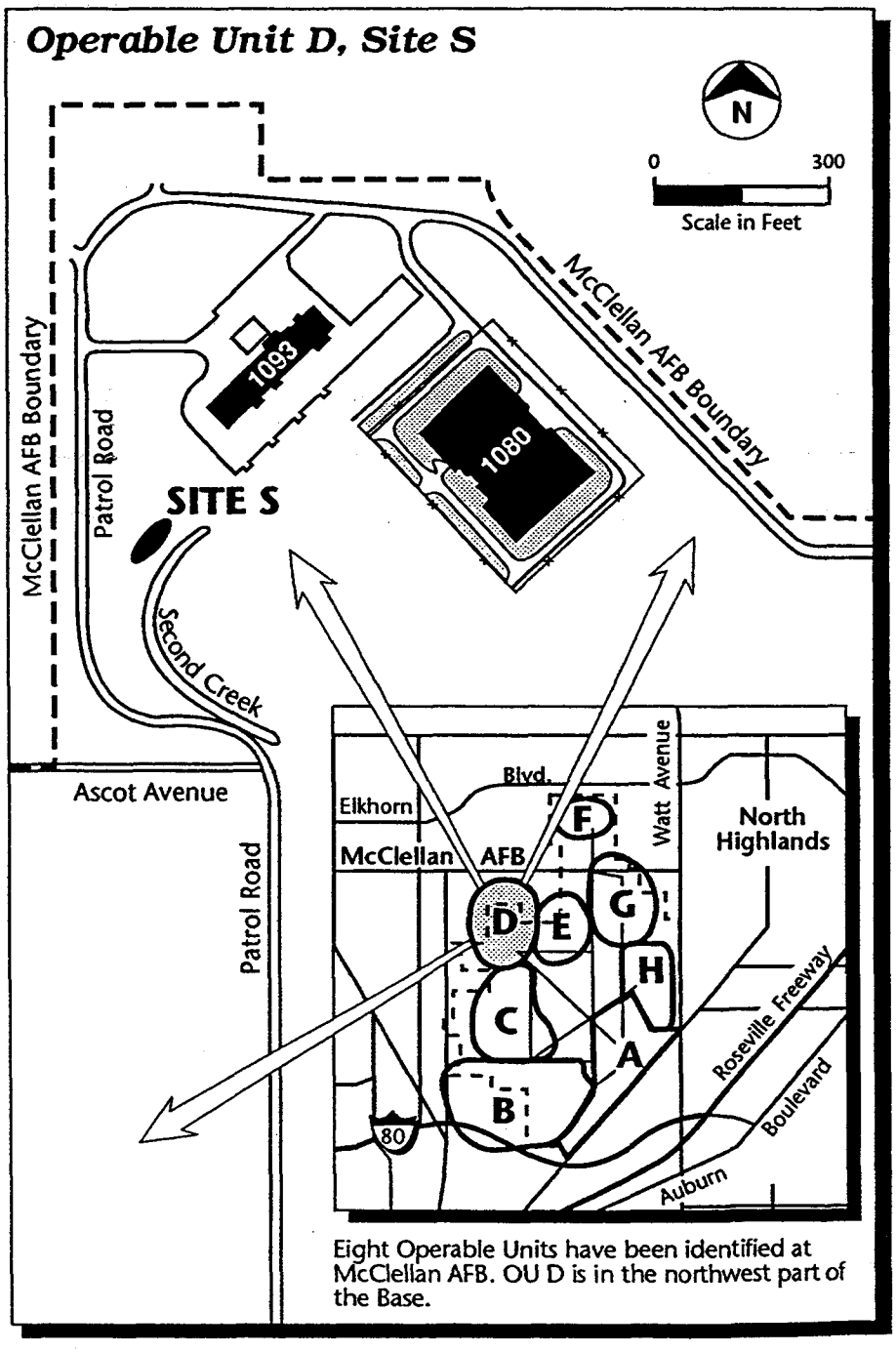
Produced by McClellan AFB Environmental Management **Number 10**

Soil Vapor Treatment Study Begins in Operable Unit D

McClellan Air Force Base is implementing a demonstrated cleanup technology called soil vapor extraction (SVE) as part of the ongoing environmental restoration program under the interagency agreement. In this technology, air is pulled through the soil and soil pore spaces to strip volatile organic compounds (VOCs) from soils contaminated with solvents and fuels. Contaminated soil vapors are vacuum extracted from the ground and sent to an offgas treatment system. As a result, subsurface sources of contamination are eliminated directly, without soil or waste excavation.

Soil vapor extraction technology is similar to the steam injection/vapor extraction process described in *The Facts*, Number 8. The difference is that no steam is injected in soil vapor extraction. Ambient or heated air may be injected or allowed to passively enter the ground and move through the soil. Vapors are vacuum extracted from the soil by pulling a negative pressure on wells that are screened (perforated) in the soil zone where the contamination is present. Contaminants are recovered as vapors that are treated by adsorption on activated carbon or by catalytic oxidation. Air emissions released from the offgas treatment system must meet applicable federal, state, and local air quality requirements.

Field studies of SVE technology are underway in Site S of Operable Unit D (see map at right). Site S, a pit approximately 9,200 square feet in area, was one of 12 prior waste disposal sites in the northwest area of the base. It was used for disposal of jet fuels and cleaning solvents. The pit extended four to 15 feet below



Eight Operable Units have been identified at McClellan AFB. OU D is in the northwest part of the Base.

ground surface prior to being filled with soil. Contamination moved through the pit into the underlying soils. Groundwater is approximately 100 feet below the surface.

The field studies are in two phases. In the first phase conducted this summer, the site was tested to gather pilot system design information such as soil permeability and the nature and extent of soil contamination in and below the pit. Results of this study phase will be available in November 1991, and copies of the study reports will be placed in the public information repositories at the Rio Linda Branch Library and the McClellan AFB Library. The second phase will be installation of a pilot SVE system in 1992 to test the technology at Site S.

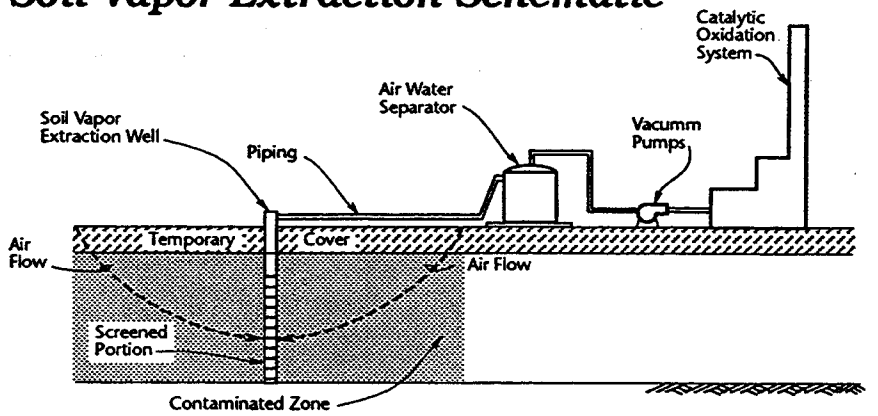
Site S (and all of Operable Unit D) is covered by a low permeability cap to prevent soil gas from venting to the surface and to keep rainwater from entering the soils. The design of the system will include measures to allow installation of SVE wells without jeopardizing the integrity of the existing cap.

Soil vapor extraction technology has been used for cleanup of soil contamination at hundreds of sites in the United States and other countries. Sites where it has been used range in size from one-tank gasoline stations to Superfund sites with multiple sources of contamination. Concentrations of hydrocarbon contaminants (e.g., fuels and solvents) can be reduced from 95 to 100 percent, with recovery rates typically around 150 pounds per day. The McClellan AFB pilot system demonstration is expected to take six to nine months to complete once the system becomes operational.

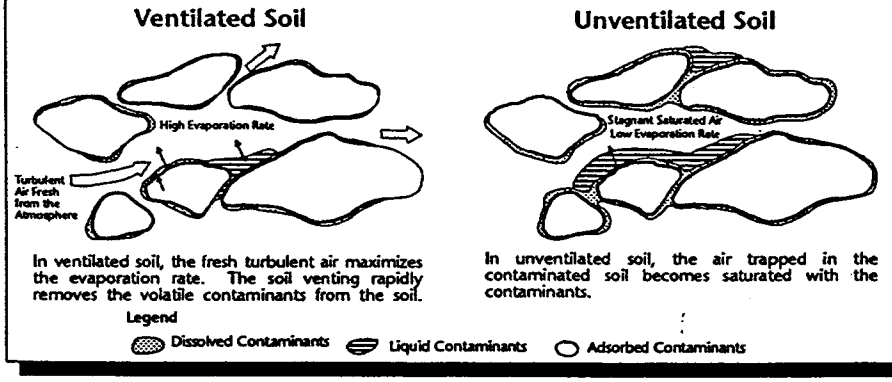
Prior field tests at Hill Air Force Base in Utah have shown cost-effective results. A system of 16 extraction wells, with an average depth of 50 feet, removed 114,960 pounds of hydrocarbon contamination over a 10-month period. Catalytic oxidation was used to treat the vented offgas. The estimated cost was $22 per cubic yard of treated soil. In contrast, soil excavation followed by onsite soil incineration may cost as much as $300 per cubic yard.

McClellan AFB is working with the regulatory agencies and contractors to implement the treatability study. Preliminary results from Site S indicate that the pilot scale system may be able to remove contaminants at an initial rate of 300 pounds per day, or more. For comparison, the groundwater extraction and treatment system at the base has removed approximately 20,150 pounds of contaminants in 4.5 years of operation, or an average of 12.3 pounds per day. Early indications are that SVE technology may prove to be an efficient and cost-effective cleanup alternative. If successful in pilot tests, it may be used alone or in combination with groundwater treatment to clean up other sites on the base.

Soil Vapor Extraction Schematic



Evaporation of Volatile Contaminants by Soil Vapor Extraction



For More Information Contact

Community Affairs Coordinators

Victoria Merriweather
McClellan AFB
Environmental Management
643-1250

Andrew Bain
U.S. EPA
(415) 744-2184

Sue Sher
Cal-EPA
855-7802

Public Representatives

Burl Taylor
County of Sacramento
[redacted]

Barbara Walsh
AFGE Local 1857
[redacted]

Chuck Yarbrough
City of Sacramento
[redacted] (day)
[redacted] (evening)